Climate Change and Human Health Literature Portal

National Institute of Environmental Health Sciences

Putting vulnerability to climate change on the map: A review of approaches, benefits, and risks

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Abstract:

There is growing demand among stakeholders across public and private institutions for spatially-explicit information regarding vulnerability to climate change at the local scale. However, the challenges associated with mapping the geography of climate change vulnerability are non-trivial, both conceptually and technically, suggesting the need for more critical evaluation of this practice. Here, we review climate change vulnerability mapping in the context of four key questions that are fundamental to assessment design. First, what are the goals of the assessment? A review of published assessments yields a range of objective statements that emphasize problem orientation or decision-making about adaptation actions. Second, how is the assessment of vulnerability framed? Assessments vary with respect to what values are assessed (vulnerability of what) and the underlying determinants of vulnerability that are considered (vulnerability to what). The selected frame ultimately influences perceptions of the primary driving forces of vulnerability as well as preferences regarding management alternatives. Third, what are the technical methods by which an assessment is conducted? The integration of vulnerability determinants into a common map remains an emergent and subjective practice associated with a number of methodological challenges. Fourth, who participates in the assessment and how will it be used to facilitate change? Assessments are often conducted under the auspices of benefiting stakeholders, yet many lack direct engagement with stakeholders. Each of these questions is reviewed in turn by drawing on an illustrative set of 45 vulnerability mapping studies appearing in the literature. A number of pathways for placing vulnerability mapping on a more robust footing are also identified.

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Resource Description

Communication: ☒

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience: ☒

audience to whom the resource is directed

Policymaker, Public

☐

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Exposure : ☒

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Extreme Weather Event, Food/Water Security, Food/Water Security, Precipitation, Sea Level Rise, Temperature

Extreme Weather Event: Flooding, Hurricanes/Cyclones

Food/Water Security: Agricultural Productivity, Fisheries

Temperature: Extreme Heat

Geographic Feature: ☒

resource focuses on specific type of geography

Ocean/Coastal, Urban, Other Geographical Feature

Other Geographical Feature : Forests

Geographic Location: ☒

resource focuses on specific location

Global or Unspecified

Health Impact: ☒

specification of health effect or disease related to climate change exposure

General Health Impact

Intervention: ☒

strategy to prepare for or reduce the impact of climate change on health

A focus of content

Mitigation/Adaptation: ☒

mitigation or adaptation strategy is a focus of resource

Adaptation, Mitigation

Model/Methodology: ☒

type of model used or methodology development is a focus of resource

Methodology

Population of Concern: A focus of content

Resource Type: ☒

format or standard characteristic of resource

Research Article, Review

Resilience: ☒

capacity of an individual, community, or institution to dynamically and effectively respond or adapt to

shifting climate impact circumstances while continuing to function

 A focus of content

Timescale: ☒

time period studied

 Time Scale Unspecified

Vulnerability/Impact Assessment: ☒

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

 A focus of content